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ABSTRACT

The purpose of this study was to determine whether or not sensitivity training increased perceptivity in recognizing the emotional meaning of others, and thus, increase accuracy in responding to an audio tape (Davitz Tape) on which nine different emotions are expressed within the content of an emotionally neutral or content free sentence. Two groups were administered the Davitz Tape. The experimental group had participated in sensitivity training, whereas the control group had not. First the tape was played through a band-pass filter so that the words were unintelligible, but most of the voice qualities were distinguishable. Following this, a tape without band-pass filtering and with a different item order was played. The subjects' tasks were to identify the emotional meaning expressed in each item on the tapes and to judge how "positive-negative" the affect of each item was on a seven step scale. Subjects in both groups significantly identified more vocally expressed meanings without band-pass filtering than with filtering. The experimental group showed a significant gain in terms of identifying negative emotional meanings with filtering. There were no significant differences between the experimental and control group subjects in terms of affective rating. (KJ)

EFFECTS OF SENSITIVITY TRAINING ON IDENTIFICATION OF EMOTIONAL MEANING WITH AND WITHOUT THE USE OF AN ELECTRONIC BAND-PASS FILTER*

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Recognition of emotional meaning in others is an important aspect of interpersonal communication. Studies reported by Davitz (1959, 1964) and others represent a novel beginning attempt to systematically study recognition of emotional meaning in others. They start with the assumption that the existence of nonverbal communication has been established, and developed an audio-tape instrument in which actors expressed nine different emotions within the context of an emotionally neutral or content free sentence. Subjects were given a list of the emotions and asked to identify the emotional meaning expressed in each of the stimuli on the audio-tape.

Davitz accurately points out that all the studies utilizing this instrument relate to the communication of assumed emotion, that the underlying emotional states of the subjects are not considered, merely the success or failure of different senders (actors) in projecting

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emotions and the success of receivers (audience or subjects) in identifying the intended emotions.

Nevertheless, it seemed that this instrument would be useful in evaluating the effectiveness of sensitivity training, since one of the traditionally prescribed goals of this process is increased perceptivity in recognizing the emotional meaning of others (Seashore, 1968; Cohen, 1969).

Unfortunately, emotional meaning presents the investigator with a slippery surface. As Parry (1968) has commented, it is not as easy to produce communications untouched by cognition. In general, cognitive messages are carriers of affect, but there are few purely affective messages.

A technique for diminishing the cognitive portion of a message without destroying it's affective content is possible through the use of an electronic band-pass filter. What the filter does is to eliminate the higher and lowest frequencies of recorded speech so that words are unintelligible, but most vocal qualities remain. Mehrabian and Ferris (1967) have reported that when subjects were asked to judge the degree of like or dislike in a filtered speech, they performed the task with a significant amount of agreement.

Combining the electronic band-pass filter's capability of diminishing the cognitive portion of the Davitz tape to subjects at the beginning and end of a sensitivity training group was the major focus of this study. It was hoped that one of the major outcomes of

sensitivity training, i.e., increased perceptivity in recognizing the emotional meaning of others, would be measurable by an increase in subject accuracy on the Davitz tape.

Procedure

A pre-test-post-test control group design was used. The experimental group consisted of 12 students participating in an 8-week sensitivity training group in a graduate seminar on small group structure and processes. The control group consisted of 10 graduate students enrolled in another seminar not having any sensitivity training.

Both groups were administered the Davitz tape, in which three male and two female actors expressed the following nine emotional states: Affection, Anger, Boredom, Cheerful, Impatience, Joy, Sad, Satisfaction, and Neutral; all within context of the following emotionally neutral or content free sentence: "I'm going out now. I won't be back all afternoon. If anyone calls, tell them I'll call back tomorrow." Subjects were given a list of the emotions and told that each emotional meaning could appear once, more than once, or not at all. The nine emotions constituted a pool of 42 items and was played twice.

First, the speakers' voices were played through a Krohn-hite (Cambridge, Mass.) Band-Pass Filter Model 310C, which was set to eliminate higher ($\searrow$ 300 Hz) and lower ($\swarrow$ 200 Hz) frequencies so that

the words of the sentence were unintelligible but most of the vocal qualities remained.

Play audio-tape
w/ band-pass filter
about here.

Following this, a tape recording without band-pass filtering and with a different item order was played. The subjects' tasks were to identify the emotional meaning expressed in each item on the tapes, which had a test-retest reliability of .74; and judge how "positive--negative" the affect of each item was on a seven-step scale.

Play audio-tape
w/o band-pass filter
about here.

The ability to identify vocally expressed emotional meaning was defined as the total number of meanings correctly identified. The Affective Rating for each item was the subjects' rating on the "positive--negative" scale.

The hypotheses to be tested were (1) that subjects in a sensitivity training group would show a greater gain in terms of correctly

identifying the vocally expressed emotional meanings, (2) that the band-pass filtered version would not significantly change the subjects' accuracy in identification of emotional meanings, and (3) that subjects in both groups would correctly identify more negative emotional meanings than positive ones, using their Affective Ratings as criteria.

Results

Subjects in both groups significantly ($< .05$) identified more vocally expressed meanings without band-pass filtering than with filtering (Table 1). Thus, the hypothesis that subjects would do as well on the band-pass filtered version as on the unfiltered version of the Davitz tape was not supported by the data.

Insert Table 1

about here.

The hypothesis that subjects in a sensitivity group would show a greater gain in terms of correctly identified emotional meanings was not supported by the data, with one exception. T-Group subjects showed a significant gain ($< .05$) in terms of identifying negative (i.e., Anger, Sad, Boredom, Impatience) emotional meanings with band-pass filtering, as compared with the control group subjects (Table 1).

In terms of Affective Ratings, and excluding the recognition of Neutral as an emotional meaning, both groups rated Anger, Sad, Boredom, and Impatience as being Negative, that is less than 4 on a scale of 1 (positive) to 7 (negative); whereas only Cheerful and Affection had mean ratings higher than 4 (Table 2). There were no significant differences between the T-Group and control group subjects in terms of the Affective Ratings.

Discussion

Although only one of the three hypotheses in this study were supported by the data, there are several points which bear on future use of the electronic band-pass filter as an instrument in research on communication of emotional meaning.

First, subjects are able to judge the degree of positive or negative affect in a filtered speech, with a significant degree of accuracy. This supports Mehrabian's (Mehrabian & Ferris) (1967) earlier findings. Thus, if an investigator desires to mask the cognitive portion of a message vis-a-vis electronic band-pass filtering, this technique is useful if one is satisfied with the dichotomous response categorization of "like--dislike; positive--negative."

This suggests a practical application. Electronic band-pass filtering forces the listener to focus on the affective portion of a message, since the cognitive portion is rendered mostly unintelligible. Consequently, I am suggesting that as a training tool this

instrument may be valuable for persons engaged in communication transactions for which there is a high need to be cued into the usually nonverbalized emotional portions of messages, e.g., administrators, teachers, social workers, psychologists, and the like. Unfortunately, the data in this study are suggestive rather than supportive for this use of band-pass filtering.

Second, it seemed feasible to hypothesize that sensitivity training would aid subjects' perceptions in this particular task, i.e., identifying vocally expressed emotional meaning. However, this was not supported by the data. One particular factor may account for these results. The fidelity of the Davitz tape ranged from poor to average. In fact, of the original 44 stimuli on the tape that Davitz sent to us, two items were eliminated from our test pool because of unacceptable fidelity.

Our data do not support Davitz's (1964) earlier finding in various studies involving similar labeling tasks. Whether this is due to the idiosyncratic fidelity of our copy of the Davitz tape used in this study, or our subjects, may only be conjectured. It is strongly suggested that any future investigator using a band-pass filter must consider the degree of audio fidelity, especially since there was a -10 dB loss in the electronic transfer process which was compensated for by our boosting the record gain levels. Obviously, this aggravated our already marginal fidelity problems.

Third, in line with the problem of audio fidelity, is the problem of using <u>only</u> vocal expression, i.e., recorded speech, for the

task of labeling emotional meanings. As one subject commented, "This is extremely difficult. It's like peeping through the keyhole of a door, and trying to describe everything about the room inside!" This investigator agrees. Consequently, we are in the process of developing a videotape/kinescope stimuli bank to be used for further research dealing with the recognition of emotional meaning. Our results so far are extremely encouraging, and I would like to show you an unedited work print that has gone through two sequential judge-edit procedures.

Play 16 mm kinescope

about here.

Although we are still in the developmental phase, we expect to report our results of standardizing this stimuli bank within the next few months (Cohen, in preparation). The sequences you saw have been correctly identified by at least 19 out of 21 judges, and in many cases, we have unanimous agreement among all 21 judges. Our problem, as we see it, may be one of little or no discrimination for this kinescope as a test instrument.

This brings me to my final point, namely if an investigator wishes to mask or distort an instrument of exceptional "fidelity", in terms of sending video and audio emotional messages, for

purposes of increasing the discrimination factor of this type of test instrument, it is suggested that electronic band-pass filtering has future use as a viable instrument.

Acknowledgment

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Table 1a

Correctly Identified Emotional Meanings

T-Group Seminar (N=12[a])

	With BP						W/o BP					
Emotion (N)[b]	Pre[c]	$\bar{X}$	Post	$\bar{X}$	Gain	$\bar{X}$	Pre	$\bar{X}$	Post	$\bar{X}$	Gain	$\bar{X}$
Anger (3)	13	3.61	22	5.56	+8	+1.95	26	7.23	26	7.23	0	0
Sad (5)	24	4.00	28	4.67	+4	+ .67	34	5.67	40	6.67	+6	+1.00
Boredom (4)	14	2.92	16	3.33	+2	+ .41	35	7.29	33	6.88	-3	- .41
Impatience (4)	11	2.28	18	3.75	+7	+1.47	24	5.00	24	5.00	0	0
Sub-total (-emotions)	62	3.20	84	4.33	+19	+1.12	119	6.30	123	6.45	+3	+ .15
Joy (3)	2	.55	4	1.11	+2	+ .56	18	5.00	21	5.83	+3	+ .83
Satisfaction (5)	6	1.00	7	1.17	+1	+ .17	18	3.00	25	4.17	+7	+1.17
Cheerful (5)	19	3.17	27	4.50	+8	+1.33	30	5.00	27	4.50	-3	- .50
Affection (4)	23	4.79	20	4.17	-3	- .62	18	3.75	19	3.96	+1	+ .21
Sub-total (+emotions)	50	2.38	58	2.74	+8	+ .36	84	4.19	92	4.62	+8	+ .43
Total (w/o Neu)	112	2.79	142	3.54	+27	+ .74	203	5.25	215	5.54	+11	+ .29
Neutral (5)	23	3.83	20	3.33	-3	- .50	33	5.50	42	7.00	+9	+1.50
Total (w/ Neu)	135	2.91	162	3.51	+24	+ .61	236	5.27	257	5.69	+20	+ .42

FOOTNOTES:

[a] $\bar{X}$ scores in T-Group corrected to match difference in group N's.

[b] No. of times this emotion was on tape.

[c] No. of correctly identified emotional meanings.

Table 1b
Correctly Identified Emotional Meanings

Control Group Seminar (N=10)

	With BP						W/o BP					
Emotion (N)[a]	Pre[b]	$\bar{X}$	Post	$\bar{X}$	Gain	$\bar{X}$	Pre	$\bar{X}$	Post	$\bar{X}$	Gain	$\bar{X}$
Anger (3)	13	4.33	3	1.00	-10	-2.33	8	2.67	13	4.33	+5	+1.66
Sad (5)	18	3.60	9	1.80	- 9	-1.80	31	6.20	38	7.60	+7	+1.40
Boredom (4)	13	3.25	12	3.00	- 1	- .25	32	7.00	31	7.75	-1	- .75
Impatience (4)	17	4.50	8	2.00	- 9	-2.50	22	5.50	20	5.00	-2	- .50
Sub-total (-emotions)	61	3.92	32	1.95	-29	-1.72	93	5.34	102	6.17	+9	+ .45
Joy (3)	1	.33	18	6.00	+17	+5.67	7	2.33	9	3.00	+2	+ .67
Satisfaction (5)	7	1.40	8	1.60	+ 1	+ .20	11	2.20	16	3.20	+5	+1.00
Cheerful (5)	10	2.00	10	2.00	0	0	21	4.20	24	4.80	+3	+ .60
Affection (4)	12	3.00	15	3.75	+ 3	+ .75	8	2.00	7	1.75	-1	- .25
Sub-total (+emotions)	30	2.18	51	3.34	+21	+1.66	47	2.63	56	3.19	+9	+ .51
Total (w/o Neu)	91	3.05	83	2.65	- 8	- .02	140	3.99	158	4.68	+18	+ .48
Neutral (5)	12	2.40	9	1.80	-3	- .60	24	4.80	27	5.40	+3	+ .60
Total (w/ Neu)	103	2.76	92	2.44	-11	- .86	164	4.10	185	4.76	+21	+ .49

[a]No. of times this emotion was on tape.

[b]No. of correctly identified emotional meanings.

Table 2

Mean Affect Ratings[a]

	T-Group (N=12)						Control Group (N=10)					
	WITH BP			W/O BP			WITH BP			W/O BP		
Emotion (N[b])	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change	Pre	Post	Change
Anger (3)	3.06	3.00	+ .06	1.97	2.50	+ .53	3.33	1.47	-1.86	2.89	2.63	- .26
Sad (5)	3.60	3.39	- .21	2.64	3.02	+ .38	3.27	3.44	+ .17	2.42	2.46	+ .04
Boredom (5)	3.46	3.42	- .04	2.27	2.81	+ .54	3.39	3.72	+ .33	2.08	2.42	+ .34
Impatience (4)	3.91	3.81	- .10	3.05	3.23	+ .18	3.78	3.99	+ .21	3.19	3.58	+ .39
Sub-total $\bar{X}$ (-emotions)	3.51	3.41	- .10	2.48	2.89	+ .41	3.44	3.16	- .28	2.65	2.78	+ .13
Joy (3)	2.79	3.50	+ .71	5.24	5.28	+ .04	2.33	4.00	+1.67	4.80	5.59	+ .79
Satisfaction (5)	4.18	4.21	+ .04	4.89	4.95	+ .06	3.75	3.87	+ .12	4.08	4.42	+ .36
Cheerful (5)	4.53	5.34	+ .81	5.24	5.35	+ .09	4.58	4.60	+ .02	5.24	4.96	- .28
Affection (5)	4.67	4.62	- .05	4.50	4.84	+ .34	4.24	4.06	- .18	3.82	3.66	- .16
Sub-total $\bar{X}$ (+ emotions)	4.04	4.42	+ .38	4.97	5.11	+ .14	3.73	4.13	+ .40	4.49	4.66	+ .17
Neutral $\bar{X}$	4.12	3.68	- .44	4.21	4.18	- .03	4.22	3.82	- .40	4.04	4.20	+ .16

[a] negative <4> positive

[b] No. of times this emotion was on tape.

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